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Table of Contents

Biometric Encryption/sup TM/–enrollment and verification procedures.

Dialog eLinks

Full text options USPTO Full Text Retrieval Options

Accession number & update

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Conference information

Optical Pattern Recognition IX, Orlando, FL, USA, 14–15 April 1998.

Sponsor(s): SPIE.

Source

Proceedings of the SPIE – The International Society for Optical Engineering, {Proc–SPIE–Int–Soc–Opt–Eng–USA}, 1998, vol. 3386, p. 24–35, 4 refs, CODEN: PSISDG, ISSN: 0277–786X. Publisher: SPIE–Int. Soc. Opt. Eng, USA.

Author(s)

Soutar–C, Roberge–D, Stoianov–A, Gilroy–R, Vijaya–Kumar–B–V–K.

Author affiliation

Soutar, C., Roberge, D., Stoianov, A., Gilroy, R., Mytec Technol. Inc., Toronto, Ont., Canada.

Abstract

Biometric Encryption/sup TM/ is an algorithm which has been developed to securely link and retrieve a digital key using the interaction of a **biometric** image, such as a fingerprint, with a secure block of data, known as a Bioscrypt/sup TM/. The key can be used, for example, as an encryption/decryption key. The Bioscrypt comprises a stored filter function, produced by a **correlation–**based image processing algorithm, as well as other information which is required to first retrieve, and then verify the validity of, the key. The process of securely linking a key with a **biometric** is known as enrollment, while the process of retrieving this key is known as verification. This paper presents details of the enrollment and verification procedures.

Descriptors

CRYPTOGRAPHY; FINGERPRINT–IDENTIFICATION; IMAGE–CODING; OPTICAL– **CORRELATION.**

Classification codes

B6120B Codes*;

B6140C Optical–information–image–and–video–signal–processing;

C6130S Data–security*;

C1250 Pattern–recognition;

C5260B Computer–vision–and–image–processing–techniques.

Keywords

Biometric–Encryption–algorithm; digital–key; **biometric–**image– interaction; fingerprint; secure–block–of–data; Bioscrypt; encryption /decryption–key; stored–filter–function; **correlation–**based–image– processing–algorithm; enrollment–procedure; verification–procedure; link–algorithm.

Treatment codes

P Practical.

Language

English.

Publication type

Conference–paper; Journal–paper.

Availability

SICI: 0277–786X(1998)3386L.24:BEEV; 1–H.

CCCC: 0277–786X/98/$10.00.

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Publication date

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Edition
>   1998041.
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>   Copyright 1998 IEE.

Image based fingerprint verification.

Accession number & update
>   0007502628 20070101.
Conference information
>   2002 Student Conference on Research and Development. SCOReD2002.
>   Proceedings. Global Research and Development in Electrical and
>   Electronics Engineering, Shah Alam, Malaysia, 16–17 July 2002.
Source
>   2002 Student Conference on Research and Development. SCOReD2002. Proceedings. Globalizing
>   Research and Development in Electrical and Electronics Engineering (Cat. No.02EX598), 2002, p.
>   58–61, 7 refs, pp. xi+522, ISBN: 0–7803–7565–3. Publisher: IEEE, Piscataway, NJ, USA.

Author(s)
>   Seow–B–C, Yeoh–S–K, Lai–S–L, Abu–N–A.
Author affiliation
>   Seow, B.C., Yeoh, S.K., Lai, S.L., Abu, N.A., Fac. of Inf. Sci. & Technol., Multimedia Univ., Bukit
>   Beruang, Malaysia.

Abstract
>   Human fingerprints have been considered as a unique signature certifying one's identity. Fingerprint
>   verification is currently the most popular technique of **biometric** personal identification. As a **biometric**
>   proof of identification, an alignment–based minutiae matching algorithm has been widely investigated,
>   however, not many have considered fingerprint identification using image based verification. An
>   image–based approach does not use minutiae features for fingerprint matching. This project investigates
>   fingerprint– scanned image verification via an inverse fast Fourier transform after a thinning process. The
>   technique may be applied directly to a gray– scale fingerprint image without pre–processing. This
>   **correlation** coefficient approach is capable of finding correspondences between the input fingerprint
>   image and the stored enrolled template with higher computational efficiency than the minutiae–based
>   method. It has the ability of robust fingerprint verification subject to external conditions. In this paper, the
>   design and implementation of a prototype of an automatic verification system is presented. The high
>   matching rate achieved in this project suggests that an efficient small–scale fingerprint verification system
>   is feasible.

Descriptors
>   FAST–FOURIER–TRANSFORMS; FINGERPRINT–IDENTIFICATION; IMAGE–MATCHING;
>   IMAGE–THINNING.
Classification codes
>   C5260B Computer–vision–and–image–processing–techniques*;
>   C4188 Integral–transforms–in–numerical–analysis.
Keywords
>   image–based–fingerprint–verification; **biometric;** fingerprint–matching;
>   inverse–fast–Fourier–transform; thinning; gray–scale–fingerprint–
>   image; **correlation–**coefficient–approach; stored–enrolled–template;
>   automatic–verification–system.
Treatment codes
>   P Practical.
Language
>   English.
Publication type
>   Conference–paper.

Availability
> CCCC: 0–7803–7565–3/02/$17.00.
> Other format availability: Also available on CD–ROM in PDF format.

Digital object identifier
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> 2002.

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Fingerprint verification using correlation filters.

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> 0008178096 20070101.

Conference information
> Audio– and Video–Based **Biometric** Person Authentication. 4th
> International Conference, AVBPA 2003. Proceedings, Guildford, UK, 9–11
> June 2003.

Source
> Audio– and Video–Based **Biometric** Person Authentication. 4th International Conference, AVBPA 2003.
> Proceedings (Lecture Notes in Computer Science Vol.2688), 2003, p. 886–94, 14 refs, pp. xvii+978,
> ISBN: 3–540–40302–7. Publisher: Springer–Verlag, Berlin, Germany.

Author(s)
> Venkataramani–K, Vijaya–Kumar–B–V–K. Editor(s): Kittler–J, Nixon–M–S.

Author affiliation
> Venkataramani, K., Vijaya Kumar, B.V.K., Dept. of Electric. and Comput. Eng., Carnegie Mellon Univ.,
> Pittsburgh, PA, USA.

Abstract
> We investigate the use of **correlation** filters for fingerprint verification. **Correlation** filters have
> advantages such as their built– in shift invariance, closed form expressions, graceful degradation, and
> their ability to trade off discrimination for distortion tolerance. The NIST special database 24 is used here
> to evaluate fingerprint verification performance in the presence of distortions.

Descriptors
> **CORRELATION–**METHODS; FINGERPRINT–IDENTIFICATION; IMAGE–MATCHING;
> VISUAL–DATABASES.

Classification codes
> B6135E Image–recognition*;
> B6140 Signal–processing–and–detection;
> C1250M Image–recognition*;
> C1260S Signal–processing–theory;
> C5260B Computer–vision–and–image–processing–techniques;
> C6160S Spatial–and–pictorial–databases.

Keywords
> fingerprint–verification; **correlation–**filter; built–in–shift–
> invariance; closed–form–expression; graceful–degradation; distortion–
> tolerance; NIST–special–database–24; pattern–matching.

Treatment codes
> P Practical;
> T Theoretical–or–mathematical.

Language
> English.

Publication type
> Conference–paper.

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Iris verification using correlation filters.

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Author(s)
> Vijaya–Kumar–B–V–K, Chunyan–Xie, Thornton–J. Editor(s): Kittler–J, Nixon–M–S.

Author affiliation
> Vijaya Kumar, B.V.K., Chunyan Xie, Thornton, J., Dept. of ECE, Carnegie Mellon Univ., Pittsburgh, PA,
> USA.

Abstract
> Iris patterns are believed to be an important class of biometrics suitable for subject verification and
> identification applications. Earlier methods proposed for iris recognition were based on generating iris
> codes from features generated by applying Gabor wavelet processing to iris images. Another approach to
> image recognition is the use of **correlation** filters. **Correlation** filter methods differ from many
> image–based recognition approaches in that two–dimensional Fourier transforms of the images are used
> in this approach. In **correlation** filter methods, normal variations in an authentic iris image can be
> accommodated by designing a frequency–domain array (called a **correlation** filter) that captures the
> consistent part of iris images while deemphasizing the varying parts. **Correlation** filters also offer other
> benefits such as shift–invariance, graceful degradation and closed–form solutions. We discuss the basics
> of **correlation** filters and show how they can be used for iris verification.

Descriptors
> CHARACTER–RECOGNITION; **CORRELATION–**METHODS; EYE; FILTERS; FOURIER–
> TRANSFORMS; FREQUENCY–DOMAIN–ANALYSIS; IMAGE–RECOGNITION.

Classification codes
> B6135E Image–recognition*;
> B0290X Integral–transforms–in–numerical–analysis;
> C1250B Character–recognition*;
> C1250M Image–recognition;
> C4188 Integral–transforms–in–numerical–analysis.

Keywords
> iris–verification; **correlation–**filter–method; biometrics;
> verification–application; identification–application; Gabor–wavelet–

processing; image–based–recognition–approach; two–dimensional–Fourier–
transform; authentic–iris–image; frequency–domain–array.

Treatment codes
T Theoretical–or–mathematical.

Language
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Publication type
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Incremental updating of advanced correlation filters for biometric authentication systems.

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MD, USA, 6–9 July 2003.
Sponsor(s): IEEE Signal Process. Soc., Comput. Soc., Circuits & Syst.
Soc, Commun. Soc.

Source
Proceedings 2003 International Conference on Multimedia and Expo (Cat. No.03TH8698), 2003, vol.3, p.
III–229–32 vol.3, 10 refs, pp. 3 vol.(li +868+852+636), ISBN: 0–7803–7965–9. Publisher: IEEE,
Piscataway, NJ, USA.

Author(s)
Savvides–M, Venkataramani–K, Kuman–B–V–K–V.

Author affiliation
Savvides, M., Venkataramani, K., Kuman, B.V.K.V., Electr. & Comput. Eng., Carnegie Mellon Univ.,
Pittsburgh, PA, USA.

Abstract
In this paper we show mathematical formulation of incrementally building advanced **correlation** filters
used in authentication systems that are based on face and fingerprint images as biometrics for
verification. This method is crucial for incorporating such algorithms on small devices with limited memory
and computational resources. We also present results that show that these **correlation** filters perform
well for face and fingerprint images. We used the PIE (pose, illumination and expression) database from
CMY to test the verification performance using face images. Similarly, for fingerprint images we used the
NIST special database 24 to evaluate verification performance.

Descriptors
CORRELATION–METHODS; FACE–RECOGNITION; FINGERPRINT–IDENTIFICATION;
VISUAL–DATABASES.

Classification codes
B6135E Image–recognition*;
B6140B Filtering–methods–in–signal–processing;
C5260B Computer–vision–and–image–processing–techniques*;
C6160S Spatial–and–pictorial–databases.

Keywords

advanced–correlation–filters; **biometric–**authentication; fingerprint–
images; pose–database; face–images; expression–database; illumination–
database.

Treatment codes
P Practical.

Language
English.

Publication type
Conference–paper.

Availability
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Using composite correlation filters for biometric verification.

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Proceedings of the SPIE – The International Society for Optical Engineering,
{Proc–SPIE–Int–Soc–Opt–Eng–USA}, 2003, vol. 5106, p. 13–21, 13 refs, CODEN: PSISDG, ISSN:
0277–786X. Publisher: SPIE–Int. Soc. Opt. Eng, USA.

Author(s)
Kumar–B–V–K–V, Savvides–M, Chunyan–Xie, Venkataramani–K, Thornton–J.

Author affiliation
Kumar, B.V.K.V., Savvides, M., Chunyan Xie, Venkataramani, K., Thornton, J., Dept. of Electr. & Comput.
Eng., Carnegie Mellon Univ., Pittsburgh, PA, USA.

Abstract
Biometric verification refers to the process of matching an input **biometric** to stored **biometric**
information. In particular, **biometric** verification refers to matching the live **biometric** input from an
individual to the stored **biometric** template of that individual. Examples of biometrics include face images,
fingerprint images, iris images, retinal scans, etc. Thus, image processing techniques prove useful in
biometric recognition. In particular, composite **correlation** filters have proven to be effective. In this
paper, we will discuss the application of composite **correlation** filters to **biometric** verification.

Descriptors
BIOMETRICS–ACCESS–CONTROL; **CORRELATION–**METHODS; FACE–RECOGNITION;
FILTERING–THEORY; FINGERPRINT–IDENTIFICATION; PATTERN–MATCHING.

Classification codes
C5260B Computer–vision–and–image–processing–techniques*;
C1250M Image–recognition.

Keywords

biometric-verification; pattern-matching; face-images; fingerprint-images; iris-images; retinal-scans; **correlation-**filters; Iris.
Treatment codes
P Practical;
T Theoretical-or-mathematical.
Language
English.
Publication type
Conference-paper; Journal-paper.
Availability
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Correlation filters for recognition of live-scan fingerprints with elastic distortions.

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Conference information
Optical Pattern Recognition XIV, Orlando, FL, USA, 24-25 April 2003.
Sponsor(s): SPIE.
Source
Proceedings of the SPIE - The International Society for Optical Engineering,
{Proc-SPIE-Int-Soc-Opt-Eng-USA}, 2003, vol. 5106, p. 1-12, 15 refs, CODEN: PSISDG, ISSN:
0277-786X. Publisher: SPIE-Int. Soc. Opt. Eng, USA.
Author(s)
Watson-C-I, Casasent-D-P.
Author affiliation
Watson, C.I., Nat. Inst. of Stand. & Technol., Gaithersburg, MD, USA.
Abstract
A special NIST database of live-scan fingerprint with elastic distortion was prepared. It is used to evaluate the effect of elastic and other distortions on **correlation** filters. The need for normalized and fine vs. coarse rotationally-aligned data are addressed with performance gains for various cases noted. Procedures to test and evaluate fingerprint recognition algorithms for verification and identification are defined for the first time and initial results are presented.
Descriptors
CORRELATION-METHODS; FILTERING-THEORY; FINGERPRINT-IDENTIFICATION;
VISUAL-DATABASES.
Classification codes
B6135E Image-recognition*;
B6140B Filtering-methods-in-signal-processing;
C5260B Computer-vision-and-image-processing-techniques*;

C1250M Image–recognition;
C6160S Spatial–and–pictorial–databases.

Keywords
biometric–recognition; distortion–in–variant–filters; elastic–
distortions; fingerprint–recognition; pattern–recognition;
correlation–filters; NIST–database.

Treatment codes
P Practical;
X Experimental.

Language
English.

Publication type
Conference–paper; Journal–paper.

Availability
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Search Strategy

No.	Database	Search term	Info added since	Results
1	INZZ	key WITH generat$	unrestricted	1753
2	INZZ	1 AND (correlation OR relationship)	unrestricted	86
3	INZZ	biometric AND correlation	unrestricted	157

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